

supply of recruits in the form of advanced students possessing the requisite training to carry out investigations under direction. And if this be true of the herbaria, it holds equally in all the branches of knowledge represented in the National Museum. Really I fancy our Museum is rather anomalous in its isolation. I am confident that any understanding or arrangement that might be reached would be attended with great reciprocal advantage. Nor am I speaking without some data before me. The movement towards a closer relation between the museum and the university has already entered the experimental stage. For on several occasions during the last few years members of the Museum staff, from more than one department, have given courses of lectures in connection with the university schemes of advanced study. From all I hear, the experiment may be regarded as distinctly encouraging.

Before leaving this subject it may be appropriate to recall that the English edition of Solereder's great work on Systematic Plant-anatomy is rapidly approaching completion, and should be available very shortly. Its appearance cannot fail once more to arouse discussion as to the importance of anatomical characters. I hope the result produced may reward the devotion and labour with which Mr. L. A. Boodle and Dr. Fritsch have carried out their task.

In another and even more fundamental branch of systematic work the future seems brimful of promise. We are beginning to recognise that a vast number of the species of the systematist have no correspondence with the real units of nature, but are to be regarded rather as subjective groups or plexuses composed of closely similar units which possess a wide range of overlapping variability. That such might be the case was apparent to Linnaeus, but the proof depends on the application of precise methods of analysis.

In the year 1870 our great taxonomist Bentham happened to meet Nägeli at Munich, and, as we find recorded in Mr. Daydon Jackson's interesting life, "had half an hour's conversation with him on his views that in systematic botany it is better to spend years in studying thoroughly two or three species, and thus really to contribute essentially to the science, than to review generally floras and groups of species." Bentham does not appear to have been convinced, for his comment runs: "He is otherwise, evidently, a man of great ability and zeal, and a constant and hard worker." At the time of this interview Bentham was seventy years old, Nägeli being seventeen years his junior. The views of the latter are now bearing fruit, as we see in the important results already obtained by De Vries and others, who are following the methods of experimental cultivation with so much success.

The supposed slowness of change has been a difficulty to many. This was one of the "lions" left by Darwin in the way, and it has driven back many a "Timorous" and "Mistrust." Now, as we are gradually perceiving, it is only a chained lion after all; a thing to avoid and pass by. The detection of the origin of species and varieties by sudden mutation opens out new vistas to the systematist, and along these he will pursue his way. It will take many years of arduous work this reinvestigation of the species question. The collections of our herbaria form the provisional sorting-out from which we must start afresh. In the long run it may be that our present collections will prove obsolete, but that will not deter us. The scrap-heap is the sign and measure of all progress.

The Garden thus becomes an instrument of supreme importance in conjunction with the herbarium, and that is another reason for the transfer of South Kensington to Kew. The resources of the latter could then be directed more fully than ever to the advancement of scientific botany, and the Gardens would be revealed in a new light. For the operations and results of experimental inquiries would form a new feature, very acceptable to the specialist and public alike. And, as I am on the subject, it may not be out of place to remark that we all look forward eagerly to the time when the multifarious activities of Kew will permit the development of other features of which traces are already discernible. The arrangement of the living collections is at present based largely on horticultural convenience, geographic origin and systematic affinity, happily subordinated to an artistic or decorative treatment. In time we shall go further than that and attempt in some

degree to reflect current botanical ideas in the grouping of our plants. Let me illustrate my meaning by a good example. The Succulent House is generally conceded to form one of the most interesting and stimulating exhibits to be seen at Kew—not merely from the weird and grotesque forms assumed by the individual plants, but chiefly because here you have assembled together plants of the most varied affinity having the common bond of similar adaptations to a like type of environment. The principles that underlie the arrangement of the best sort of museum may be applied with advantage in the case of a garden, and with tenfold effect; for is not a live dandelion better than a dead *Welwitschia*? This feature, introduced as it would be with moderation and discretion, would immensely enhance the value of the Gardens both to the student and general visitor.

But to return from this digression: on the whole the time seems ripe for the new departure. Fresh lines are opening up in systematic botany that call for special provision. Now it was evident from the circumstances of the botanical renaissance twenty-five years ago that when it acquired strength some readjustment between the old and the new would have to be made. The thing was inevitable. The administrative acts of recent years all point in the same direction. The founding of the Jodrell Laboratory, the enhanced efficiency of the Gardens, the great extension of the Herbarium building, all help to pave the way. But more is wanted. Reference has been made to the advantages that would attend the migration from the Natural History Museum. But it is most important of all to devise a mechanism for securing a flow of recruits to carry on the work. This would follow in the wake of a *rapprochement* with the schools on the lines already sketched out. Difficulties, no doubt, will be encountered in the initial stages of a reorganisation, but these are inseparable from our bureaucratic system. A very hopeful sign is the readiness which the Government has shown in instituting inquiries in the past. That nothing has come of them may be attributed primarily to the attitude of botanists themselves. If they can unite on any common policy, there should be no serious delay in giving it effect.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

THE resignation of Dr. A. E. Dolbear, professor of physics at Tufts College since 1874, is announced.

DR. KUNO FISCHER has resigned the professorship of philosophy at the University of Heidelberg in consequence of ill-health.

SIR WALTER LAWRY BULLER, F.R.S., has left on trust 100*l.* to found a Maori scholarship, to be called the Buller scholarship, tenable by Maoris, but not by Europeans or half-castes.

DR. A. G. RUTHVEN, who is at present collecting reptiles and studying their field relations for the American Museum of Natural History, has been appointed curator of the museum of the University of Michigan.

THE Physical Society, Frankfurt a. M., has fitted up an electrotechnical instructional and experimental institution in which young people after finishing their apprenticeship may go through a further course in order to qualify themselves as works managers, &c.

DR. J. K. H. INGLIS, of University College, London, has been appointed principal lecturer in chemistry at University College, Reading; and Mr. F. J. Cole, of the University of Liverpool, has been appointed principal lecturer in zoology at the same institution.

PLANS are being prepared for a building for operative surgery and experimental pharmacy, and for the new university hospital in connection with the college of medicine and surgery, the University of Minnesota, this having been made possible by the recent bequest by Dr. A. F. Elliott of 30,000*l.*

THE Austrian Government has sanctioned the granting of the title of "Doktor der Bodenkultur" to be conferred upon those students of the Vienna High School for Agri-

culture who pass a satisfactory examination, which shall consist of the preparation of a scientific thesis and a *viva voce* ordeal of not more than two hours.

THE "Craggs" research prize will be awarded by the London School of Tropical Medicine in October next to a past or present student of the school who during the year (October, 1905, to October, 1906) has made the most valuable contribution to tropical medicine. The competing essays must reach the medical tutor of the school on or before October 1.

PROF. G. S. BOULGER has accepted the post of honorary professor and external examiner for the diploma at the Royal Agricultural College, Cirencester, in succession to the late Dr. W. Fream, and Mr. W. Hunting has accepted the position of honorary professor and examiner for the diploma of the same institution in succession to the late Sir G. Brown, C.B.

ACCORDING TO *Science*, the General Education Board, endowed by Mr. J. D. Rockefeller with 2,000,000*l.*, has made the following appropriations to nine institutions on condition that the sums in question be augmented three times in value from other sources:—Coe College, Cedar Rapids, Ia., 10,000*l.*; Washburn College, Topeka, Kan., 5000*l.*; Tulane University, New Orleans, 15,000*l.*; Wofford College, Spartanburg, S.C., 5000*l.*; Furman University, Greenville, S.C., 5000*l.*; Wake Forest College, N.C., 7500*l.*; Howard College, Birmingham, Ala., 5000*l.*; South-western University, Jackson, Tenn., 5000*l.*; and Mississippi College, Clinton, Miss., 5000*l.*

THE number of students attending the twenty-one German universities during the summer semester just ended is given as 45,630 matriculated students and 4566 non-matriculated students, 665 of these being at Berlin University. Among the matriculated students there were in Freiburg, Heidelberg, Leipzig, Munich, and Tübingen taken together 182 women, whilst the number of non-matriculated students included 1536 women. The number of science students (including mathematics) at these universities, that is, apart from the technical high schools, is given as 6323, as against 6125 in the corresponding semester of 1905; the number of pharmaceutical students is stated to have been 1767, against 1481 in 1905.

PROF. RÖNTGEN having declined the offer of the physics chair at Berlin University in succession to the late Prof. Paul Drude, the direction of the physical institute has been temporarily placed in the hands of Prof. W. Nernst, the director of the neighbouring physical chemistry institute. The designation "Physikalisch-Chemisches Institut" was only recently granted to Prof. Nernst's institution, which had hitherto been known as the "II. Chemische Institut"; it may also be observed that the equipment of the institute has been extended on the electrical side by means of a grant of 10,000 marks, so that the various workplaces have easy access to direct current of voltages of 10, 110, and 220 volts, and a low-voltage alternating current for electric furnace work.

THE following appointments have recently been made:—Dr. Wilhelm Deecke, professor of mineralogy in the University of Greifswald, as successor to Prof. Steinmann in the University of Freiburg i. B.; Dr. Johannes Walther as ordinary professor of mineralogy in the University of Halle; M. R. A. Raiss as extraordinary professor of scientific photography in the Lucerne University; Dipl.-Ing. Johannes Galli, technical director of the Annen Steel Works, Ltd., in Westphalia, as successor to the late Prof. A. Ledebur in the professorship of metallurgy in the Mining School, Freiburg, Saxony; and Dr. Karl Hintze, professor of mineralogy in the University of Breslau, has been offered an appointment in the University of Bonn, in succession to Prof. Dr. Laspeyres, retired.

THE calendar of the Merchant Venturers' Technical College, Bristol, for the session 1906-7, contains an interesting section dealing with the attempts being made in Bristol to secure the cooperation of employers in the work of educating apprentices and artisans suitably. The plans which certain firms adopt to secure this object are enumerated. Some firms pay the fees of students attending classes relating to the industry in which they are engaged; they

also in some instances provide the necessary books and instruments, or they offer prizes for the best student in their employ. Other employers increase the wages of those of their servants who attend specified classes and pass the examination held at the end of the course. The time spent at evening classes is allowed to count in reduction of the working hours of apprentices by a third class of employer. Every plan which tends to bring home the importance of technical training to the manufacturers and their workmen deserves commendation, and it is to be hoped that the Bristol experiments will be tried in other large centres of industry.

SOCIETIES AND ACADEMIES.

PARIS.

Academy of Sciences, August 6.—M. H. Poincaré in the chair.—The iodomercurates of sodium and barium: A. **Duboin**. The author has isolated crystals of the double iodide of sodium and mercury, having the composition $2\text{NaI}, \text{HgI}_2, 4\text{H}_2\text{O}$, and of the corresponding barium compound, $\text{BaI}_2, \text{HgI}_2, 5\text{H}_2\text{O}$. The latter crystals were remarkable for their length, approaching 2 cm.—The borostannates of the alkaline earths: the reproduction of nordenskiöldine: L. **Ouvrard**. Calcium borostannate, possessing crystallographic characters identical with those of the natural mineral, was obtained by heating precipitated calcium borate with tin dioxide to a white heat in a slow current of hydrogen chloride.—The influence of the temperature of dehydration of alabaster on the setting of the plaster obtained: E. **Leduc** and Maurice **Pellet**.—The causes of the appearance of so-called anomalous forms in plants: P. **Vuillemin**.—Researches on the gaseous exchanges of a green plant developed in the light in the absence of carbonic acid, in a soil to which amides have been added: Jules **Lefèvre**. Under the above conditions it has been found that a green plant can develop, increasing its dry weight three times, without any oxygen being given off.—The action of the X-rays on the ovary of the dog: M. **Roulier**. Contrary to the results obtained with rabbits, atrophy of the ovary is very difficult to obtain, in spite of the production of serious lesions of the skin.—Experimental *nagana*. The variations in the number of the trypanosomes in the blood of the dog. The intravascular trypanolysis and trypanolytic power of the serum: A. **Rodet** and G. **Vallet**.

CONTENTS.

	PAGE
Tunnels and Tunnelling	409
Ancient Astronomy	410
Our Book Shelf:—	
Glück: "Biologische und morphologische Untersuchungen über Wasser- und Sumpfgewächse"	411
Latter: "School Gardening for Little Children"	411
Letter to the Editor:—	
The Earth's Interior.—Sir Oliver Lodge, F.R.S.	412
The Earthquake in South America	412
Prof. Brouardel. By A. N.	412
Notes	413
Our Astronomical Column:—	
Comet 1906 <i>d</i>	417
A Memorial to the late Prof. Tacchini	417
Report of the Paris Observatory for 1905	417
Italian Observations of the Total Solar Eclipse (1905)	417
The Spectra of Sun-spots and Red Stars	418
The British Association	
Section G.—Engineering (<i>Illustrated</i>).—Opening Address by J. A. Ewing, LL.D., F.R.S., M.Inst.C.E., President of the Section	418
Section I.—Physiology.—Opening Address by Prof. Francis Gotch, M.A., D.Sc., F.R.S., Waynflete Professor of Physiology in the University of Oxford, President of the Section	422
Section K.—Botany.—Opening Address by Prof. F. W. Oliver, M.A., D.Sc., F.R.S., President of the Section	429
University and Educational Intelligence	435
Societies and Academies	436